DOCUMENT RESUME

ED 271 266 RC 015 823

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TITLE Factors Affecting Performance of New Mexico High School Students.
PUB DATE 23 Oct 85
NOTE 10p.; Paper presented at the meeting of the Rocky Mountain Educational Research Association (Las Cruces, NM, October 23, 1985).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Academic Achievement; Comparative Analysis; *Consumer Education; Demography; Differences; Ethnic Origins; High Schools; High School Students; *Home Economics; Institutional Characteristics; Instructional Program Divisions; *Performance Factors; Rural Urban Differences; Scores; Sex; *Standardized Tests; State Programs; Student Characteristics; *Test Interpretation; *Test Results
IDENTIFIERS *New Mexico

ABSTRACT

This research examined student demographic (gender, ethnicity, grades, and previous home economics experience) and geographic (rural/urban school locale and individual school) factors that may be related to performance on a statewide New Mexico achievement test under development in the home economics subject matter area of consumer education and resource management. Subjects were 375 high school students--from 18 different schools in New Mexico--who completed the test instrument in spring 1984. Comparisons of the means of the test scores indicated significant differences only with respect to student ethnic origin and individual schools. These results implied that specific groups of students may benefit from additional instruction in consumer education and resource management topics prior to testing. Findings also indicated initial remedial assistance must be implemented on a school-by-school basis, and test results may not provide a valid comparison of student differences but only that of school differences. The study concluded that the value of ascertaining student performance on state-mandated tests can be most useful in making public school educational policy decisions and that knowledge of the effect of student characteristics would enable administrators to recognize the kind and amount of confidence they could place in the test results. (NEC)

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FACTORS AFFECTING PERFORMANCE OF NEW MEXICO HIGH SCHOOL STUDENTS

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RC015823

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Factors Affecting Performance of New Mexico High School Students

Introduction

State-mandated testing has emerged as educators have become increasingly concerned about the decline in student academic achievement. Although state-mandated testing generally has been used to measure proficiency in reading, writing and mathematics, the movement has spread to other fields.

Student achievement on tests administered on a statewide basis may be associated with several factors. For example, the content of the curriculum and the depth of the material presented may vary from classroom to classroom. In addition to curriculum variation, student achievement on tests may be related to student demographics as well as geographic factors. It is these factors and their relationship to achievement on test questions in consumer education and resource management that are the focus of this research.

Background

In New Mexico, state testing in secondary home economics classes was initiated in 1973 in the general subject matter areas of child and family development, consumer education and resource management, foods and nutrition, housing and interior design, and textiles and clothing. However, in 1980 the New Mexico Department of Education instituted a two-year moratorium on state testing while the issue was studied. State testing in home economics resumed in 1982-83, at which time new tests were pilot-tested in three areas of home economics: child development, foods and nutrition, and textiles and clothing.

In anticipation of utilizing statewide testing in the remaining subject matter areas of home economics of consumer education and resource management, housing and interior design, and human relationships, the New Mexico Department of Education, Vocational Division, funded a project, "Development of Statewide Tests for Consumer Education," through the Department of Home Economics, New Mexico State University, Las Cruces. The purpose of the project was to develop and validate test questions in these remaining areas of home economics.

Preliminary test questions developed as part of the project described above were used to produce an instrument for measuring the student performance in consumer education and resource management. In addition, a panel of experts in the field of consumer education and resource management was assembled to assist in the final stages of test development.

Purpose of the Study

Knowledge regarding factors of students associated with test performance can equip educators with data that will aid in curriculum decisions that facilitate the teaching of subject matter. Additionally, knowledge regarding characteristics generally associated with achievement will furnish administrators and teachers with information to develop programs to assist students strengthen competency before actual testing. Ultimately, data delineating the factors of students associated with achievement on test questions may be used to assess the effectiveness of courses, which may result in program improvement.

Scope of the Study

This research focused on the student demographics and geographic factors that may be related to performance on a test in the home

economics subject matter area of consumer education and resource management.

Demographic factors that were utilized to classify students included (a) gender, (b) ethnicity, (c) grade and (d) previous home economics experience. Geographic factors used in analysis included (a) locale of school (rural or urban) and (b) individual school.

Methods and Procedures

Subjects for this study were 375 high school students at 18 different schools in New Mexico whose teachers had volunteered participation in this project at a Future Home Economics Association/Home Economics Related Occupations (FHA/HERO) conference in March 1984 or who consented to participate via a mailed request (Table 1). The instruments were administered during the late spring of 1984. A total of 401 instruments were returned with 26 eliminated from detailed analysis. Demographic and geographic data were analyzed with respect to test performance. Analysis of variance and the F-statistic were utilized to delineate whether significant differences existed between the means of the test scores for the various factors. The level of significance was established at the 0.05 level.

Results and Conclusions

Demographic Factors

Comparisons of the means of the test scores by gender indicated no significant difference between students who were male and those who were female (Table 2 and Table 3). However, there was a significant difference ($F[3, 352] = 2.76$, $p < .05$) between the means of the test scores with respect to the ethnic origin of the student. No significant

Table 1. Classification of Students Utilized in Analysis of Achievement on the Test

Characteristic	Number	Percent of Subjects
Demographic Factors		
Gender[a]		
Males	118	31.47
Females	257	68.53
Ethnic Origin[a]		
Native American	43	11.47
Anglo	132	36.20
Black	7	1.87
Hispanic	193	51.46
Grade[a]		
9	61	16.27
10	58	15.47
11	120	32.00
12	136	36.26
Home Economics Courses[b]		
Yes	234	62.40
No	141	37.60
Geographic Factors		
Locale of School[a]		
Rural	95	25.33
Urban	280	74.67
School	18	-

[a]Total is 375 for each characteristic

[b]Respondents may have indicated more than one grade

Table 2. Classification of Mean Test Scores for Student Characteristics

Characteristic	n	Mean Score (26 total score)	Standard Deviation ($\sqrt{MSE}$ from ANOVA)
		Demographic Factors	
Gender			3.38
Males	118	12.54	
Females	257	13.18	
Ethnic Origin			3.38
Native American	43	11.46	
Anglo	132	14.93	
Black	7	15.00	
Hispanic	193	11.91	
Grade			3.41
9	61	11.02	
10	58	12.43	
11	120	13.66	
12	136	13.50	
9 and 10	119	11.77	
11 and 12	256	13.58	
Home Economics Courses			3.41
Yes	141	12.20	
No	234	13.45	
		Geographic Factors	
Locale of School			3.37
Rural	95	12.38	
Urban	280	13.19	
School	18	8.00 - 19.00	3.37

Table 3. Factors Affecting Performance of New Mexico High School Students

Characteristic	Significance
Demographic Factors	
Gender	No significant difference
Ethnic Origin	P* = .0402
Grade	No significant difference
Home Economics Classes	No significant difference
Geographic Factors	
Locale of School (Rural/Urban)	No significant difference
School	P* = .0001

differences were found between average scores for grade or between mean test scores of students who had previously taken home economics courses and those who had not previously taken home economics courses.

Geographic Factors

There was no significant difference in mean test scores of students attending schools in a rural location and those in an urban location. Of major importance to the results was that there was a significant difference ($F[17,30] = 10.86$, $P<.01$) between the means of the test scores for individual schools.

Implications and Conclusions

Analysis of the data provided the basis to draw several conclusions. First, performance on the test appeared to be related to ethnic origin. If the ethnicity of the students who participated in

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this study accurately reflects the state population of consumer education students, the implications of these results are far-reaching. The potential for specific groups of students to score significantly lower on a state-mandated test implies that these students may benefit from additional instruction in consumer education and resource management topics prior to testing.

Perhaps of more general statewide concern is that school was significantly related to the mean test scores of the students. Differences between schools might be attributed to numerous factors. Teacher differences, including educational background, teaching methods, subject-matter knowledge, educational philosophy, socio-economic background, and cultural biases are a few factors that may affect the learning that occurs in the classroom. These factors can be compounded by administrative aspects. Administrative components affecting the educational progress in the classroom may include budget limitations, class size, support by administration of the program, support by administration of teachers with respect to student discipline problems, and policy allowing teahers to participate in professional updating. Input from state-level administration may include availability of financial resources, curriculum emphasis, and state-level mandates that reflect federal legislation or policy.

The implication of these influential factors in the classroom must be considered when analyzing the results from state-administered tests. However, it must be recognized that these factors are inherent in state testing programs and to attempt their control would be a difficult task.

Ultimately, the value of attaining knowledge regarding student performance on state-mandated tests can be most useful in making decisions regarding educational policy directed at public schools. Knowledge of this nature would be beneficial when determining the appropriateness of adopting a statewide testing program. Additionally, knowledge regarding the effect of the characteristics of students associated with performance on a state test would enable administrators to recognize the kind and amount of confidence they could place in the test results. This, in turn, would enable administrators to utilize state testing results in the most effective manner.

This research has provided information that indicates there are certain characteristics that may be related to mean test scores. The importance of acknowledging which factors may be related to mean test score is critical in applying a remedial action to improve student ability and hence student performance on tests. From this study, it also appears that initial remedial assistance must be implemented on a school-by-school basis as opposed to focusing assistance on target populations. Because of the significance of school as related to performance on the test, state administrators should address the issue of school as critical to student achievement. Particular note should be made that the use of statewide administered tests may not provide a valid comparison of student differences but only that of school differences. This conclusion may furnish evidence to school administrators that state testing may serve only a limited function in educational planning. Only after the disparity between schools no longer appears to significantly affect test performance can administrators adequately address individual student differences and problems related to specific populations.